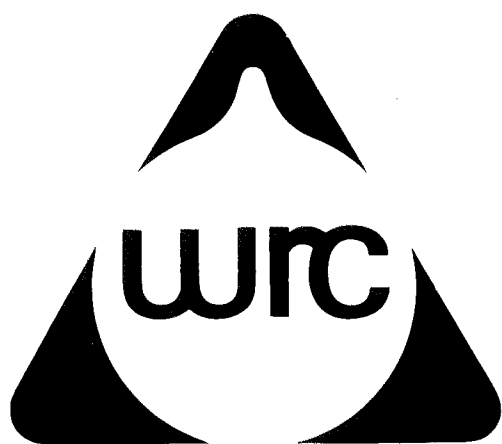
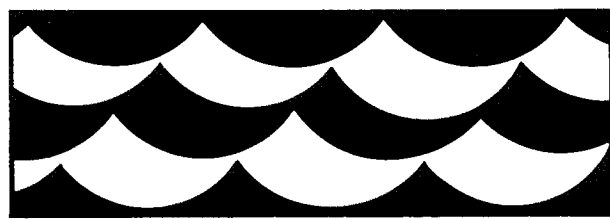




# Floodplain Management Handbook



U.S. WATER RESOURCES COUNCIL

# **FLOODPLAIN MANAGEMENT HANDBOOK**

**UNITED STATES  
WATER RESOURCES COUNCIL**

**Prepared**

**by**

**FLOOD LOSS REDUCTION ASSOCIATES  
H. James Owen and Glenn R. Wall, Principals  
(Contract No. WR18745467)**

**September, 1981**

## PREFACE

Floods are a persistent and serious problem throughout the United States. They are responsible annually for billions of dollars of losses and scores of deaths. Losses are growing rapidly and all parts of the nation are affected, including coastal, mountainous and desert regions.

A concerted national effort is under way to stem the growth of flood losses. This handbook summarizes the problem and points out what can be done. It is intended to help local officials, public interest groups and concerned citizens in assessing the problems in their area and initiating

appropriate and effective management of the floodplain.

The handbook treats both riverine and coastal floodplains. It describes a full range structural and nonstructural measure to reduce flood losses and maintain the natural values of the floodplain.

The handbook provides step-by-step guidance for developing a floodplain management program. It also identifies the range of technical and financial assistance available for preparing and implementing such programs.

## ACKNOWLEDGEMENTS

This handbook was prepared under the administrative and technical supervision of H. James Owen, Principal, Flood Loss Reduction Associates. The principal authors were H. James Owen and Glenn R. Wall. Graphics were prepared by Graphis Studios and Frank Krasnyk. James E. Goddard and L. Douglas James acted as technical advisors to the principal authors.

Timothy E. Maywalt, Floodplain Management Specialist, U.S. Water Resources Council, was the government's technical representative and provided guidance and coordination. He also led the Council's interagency work group which reviewed drafts of the handbook and offered many valuable suggestions. Other members of the work group were:

Patricia A. Bloomgren  
Department of Natural Resources  
State of Minnesota

Curt Chandler and John Gambel  
Federal Insurance Administration  
Federal Emergency Management  
Agency

Allen F. Flanders  
National Weather Service  
Department of Commerce

Karl Klingelhofer and  
Donald B. von Wolffradt  
Soil Conservation Service  
Department of Agriculture

Mr. Albert Mathews  
Natural Resources Commission  
State of Nebraska

Jerome Q. Peterson  
Office of the Chief of Engineers  
Department of the Army

James M. Wright  
Tennessee Valley Authority

Two advisory committees reviewed drafts of the handbook. Members represented local officials, community interest groups and the public. One committee was composed of members without experience in floodplain management and the other of members with extensive experience.

Those serving on the committee included:

Gerald J. Burns  
Gulf Shores, AL

Diane J. Blake  
Boise, ID

George Campbell  
Phoenix, AZ

Alice Hamilton  
Omaha, NE

Ray Hemstreet  
Franklin, TN

Ben M. Knox, Jr.  
St. Louis, MO

Priscilla E. Nutbrown  
St. Johnsbury, VT

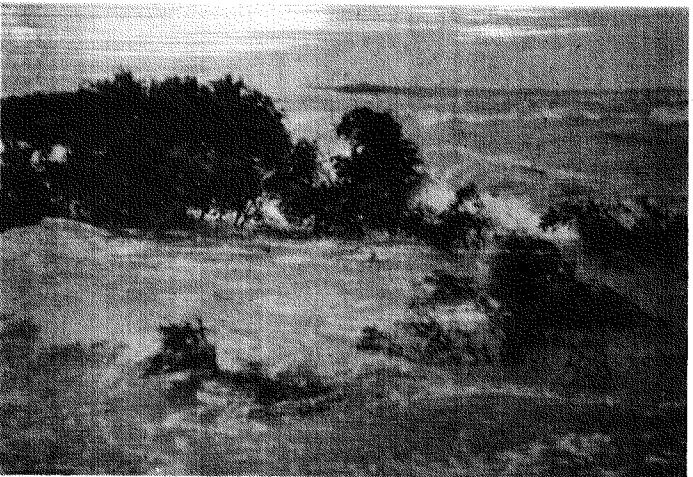
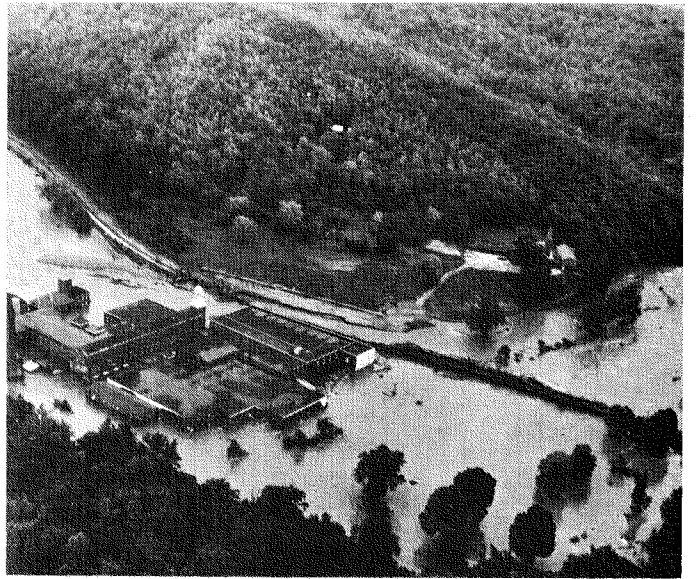
John Richardson  
San Jose, CA

Alan Salinger  
Easton, PA

Jack Sweek  
Seattle, WA

## TABLE OF CONTENTS

Preface.....	i
Acknowledgements.....	ii
CHAPTER 1 - INTRODUCTION.....	1
Background.....	1
Purpose.....	3
Scope.....	4
CHAPTER 2 - SEVEN PERCENT OF OUR LAND: THE FLOODPLAIN.....	5
Causes of Flooding.....	7
Importance of Natural Role of Floodplains.....	10
Man's Use of the Floodplain.....	13
Causes of Flood Problems.....	14
Types of Flood Problems.....	15
CHAPTER 3 - FLOODPLAIN MANAGEMENT.....	19
Definition of Floodplain Management.....	19
Need for Floodplain Management.....	21
Advantages of Floodplain Management.....	22
Making the Shift.....	23
Division of Responsibilities.....	24
Governmental Roles.....	27
CHAPTER 4 - STRATEGIES AND MEASURES.....	29
Reducing Flood Losses.....	29
Natural Values of Floodplains.....	50
CHAPTER 5 - DEVELOPING A FLOODPLAIN MANAGEMENT PROGRAM.....	53
Establishing Objectives.....	53
Identifying Problems and Needs.....	55
Problem Solving Strategies.....	57
CHAPTER 6 - IMPLEMENTING THE PROGRAM AND MAKING IT WORK.....	63
Program Adoption.....	63
Preparing for Implementation.....	63
Implementation.....	66
Operation and Maintenance.....	67
Program Evaluation.....	69
APPENDIX A - GLOSSARY.....	A-1
APPENDIX B - REFERENCES.....	B-1
APPENDIX C - SOURCES OF ASSISTANCE.....	C-1



*Flood damages are one of the most serious and widespread problems faced by local officials.*